CITIZEN
Micro HumanTech

Service Manual

COMPACT LINE THERMAL PRINTER
CT-P292/293 Series

Revision 1.00　2010.2.15

CITIZEN SYSTEMS JAPAN CO., LTD.

REVISIONS

Rev No.	Date	Page	Comment
1.00	2010/2/15		Newly issued

CONTENTS

INTRODUCTION

This manual describes the disassembly, reassembly, and maintenance procedures of CT-P292/293 Series.

1. DISASSEMBLY AND REASSEMBLY

Note the following items when performing maintenance of the printer.

- Do not disassemble, reassemble, or adjust the printer unnecessarily when the printer operation is satisfactory.
- Do not loosen the screws that fasten the components unless it is absolutely necessary.
- After finishing inspection, perform a check to ensure that there is no irregularity before turning on the printer.
- Use caution not to leave any part or screw used for maintenance inside the printer.
- When handling the print head and electronic components, care must be taken to avoid static electricity.
- When disassembling or reassembling the printer, check the wires and cords for damage. Do not draw any wire or cord by force.
- Lubricate the components as necessary when reassembling them.

1-1. Tools Used

- Phillips screwdriver #0, #1, and #2
- Precision flat head screwdriver (2.0 mm)
- Tweezers
- Long-nose pliers
- Brush

1-2. Disassembly Procedure

1-2-1. Disassembling the Printer

1. Disassembling “COVER, OPE-PANE”

Press in the lugs on the right and left at “COVER, OPE-PANE” and remove “COVER, OPE-PANE” toward you.





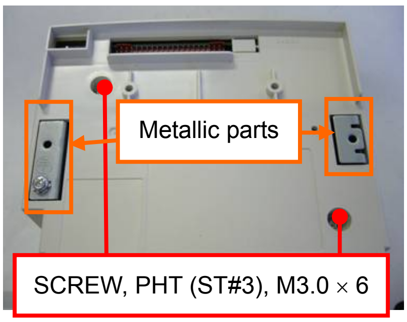
<Precaution at reassembly>

Engage the lugs at “COVER OPE-PANE” to “CASE L”.

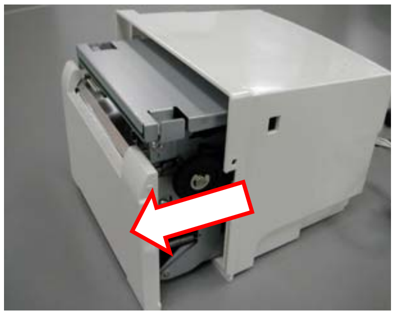
Try to pull “COVER OPE-PANE” toward you to check that it is securely fitted.

2. Disassembling “CASE L”

Remove two “SCREW, PHT (ST#3), M3.0 × 6” that fasten “SA, FRAME BASE”, and pull it toward you while holding the both edges of “SA, DOOR FRONT”.







<Precaution at reassembly>

When reassembling “CASE L”, put it smoothly without hitch.

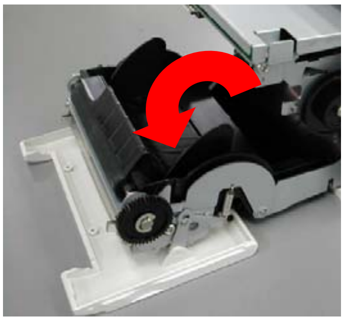
If it cannot be inserted smoothly, pull it toward you and insert it back again.

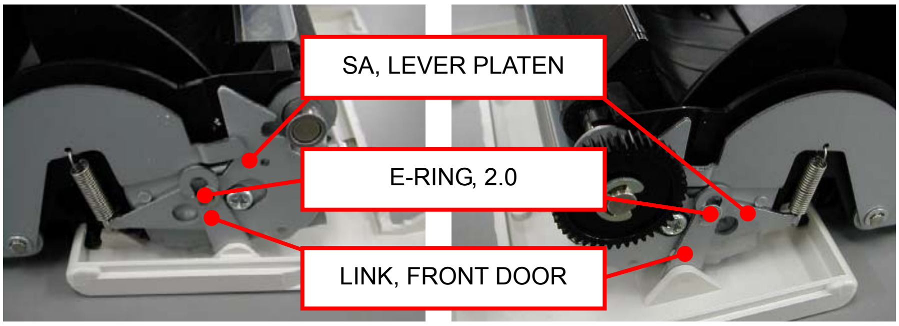
Check that the metallic part comes into view through the holes at “CASE L”.

3. Disassembling “DOOR FRONT”

Flip down “SA, DOOR FRONT” toward you.

Remove “E-RING, 2.0” that fasten “LINK, FRONT DOOR” and “SA, LEVER PLATEN” at the right and left, and disengage “LINK, FRONT DOOR” from “DOOR FRONT”.



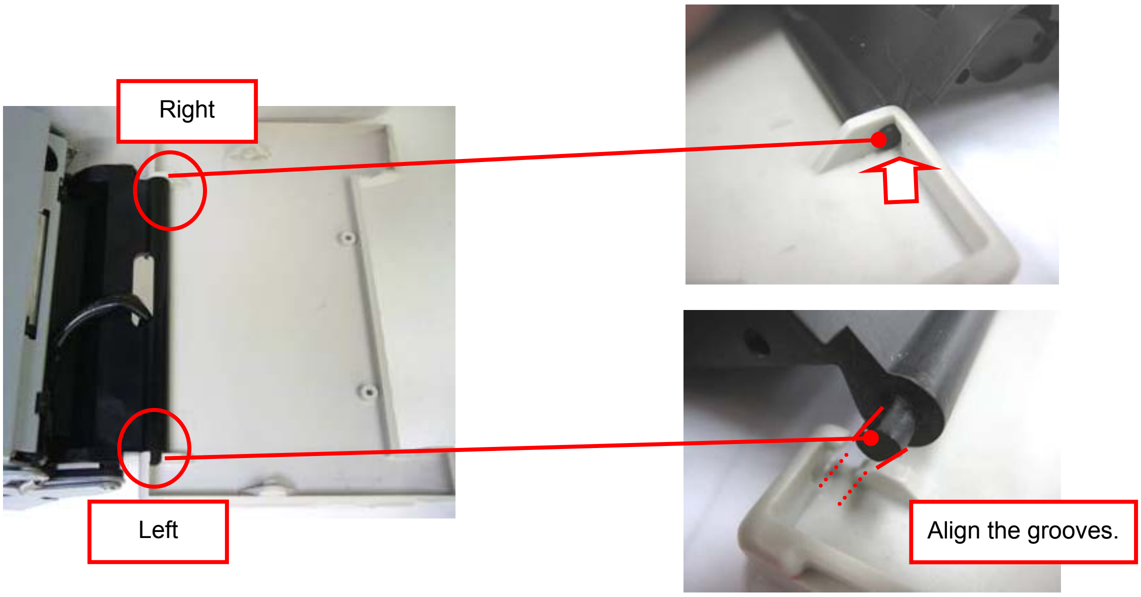


<Precaution at disassembly / reassembly>

Keep the bosses at “LINK, FRONT DOOR” facing inwardly and hang them to “DOOR FRONT”. Put “LINK, FRONT DOOR” to the pins at “SA, LEVER PLATEN” and secure it using “E-RING”.

Open “DOOR FRONT” and detach it from the shaft at “HOLDER PAPER”.

On the left side, align the grooves at the shaft with the notches at “DOOR FRONT”, and slide “DOOR FRONT” to the right to remove it.



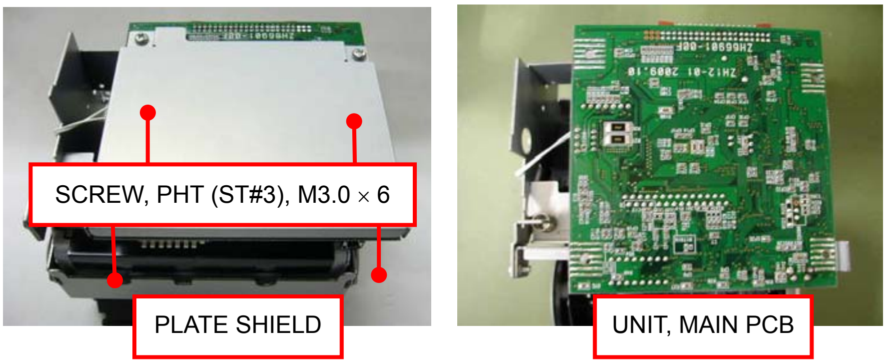
<Precaution at disassembly / reassembly>

Note that the left side of “DOOR FRONT” can be inserted or removed only in a correct orientation.

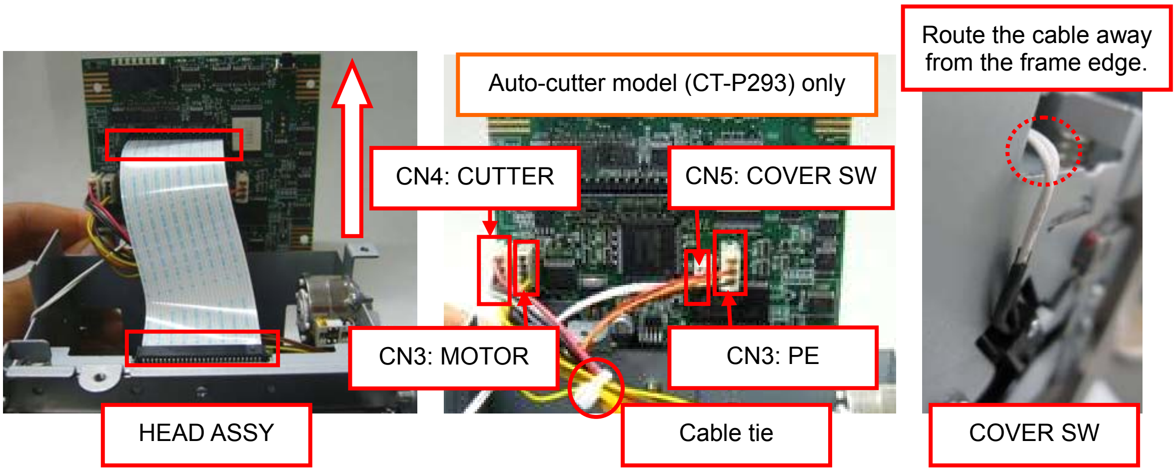
When reassembling, insert the right side first, then the left side.

4. Disassembling "UNIT, MAIN PCB"

Remove four "SCREW, PHT (ST#3), M3.0 × 6", and detach "UNIT, MAIN PCB" that is secured between "PLATE SHIELD" and "SA, FRAME BASE".



Raise the front edge of "UNIT, MAIN PCB" and disconnect "FFC CABLE" from the connectors at the "HEAD ASSY" side and the "UNIT, MAIN PCB" side. Then, remove the other connectors and cut the cable tie.



<Precaution at disassembly / reassembly>

When connecting or disconnecting "FFC CABLE", keep it straight. Insert "FFC CABLE" while facing the character-printed side upward.

When routing the cable for "COVER SW", keep the cable away from the frame edge and do not tie it together with any other cables.

Secure the other cables using a cable tie. (Loop back the motor cable only.)

Be careful not to allow the cables to get caught unnecessarily.

1-2-2. Disassembling “UNIT, MECHANISM”

1. Disassembling “SA, HOLDER PAPER”

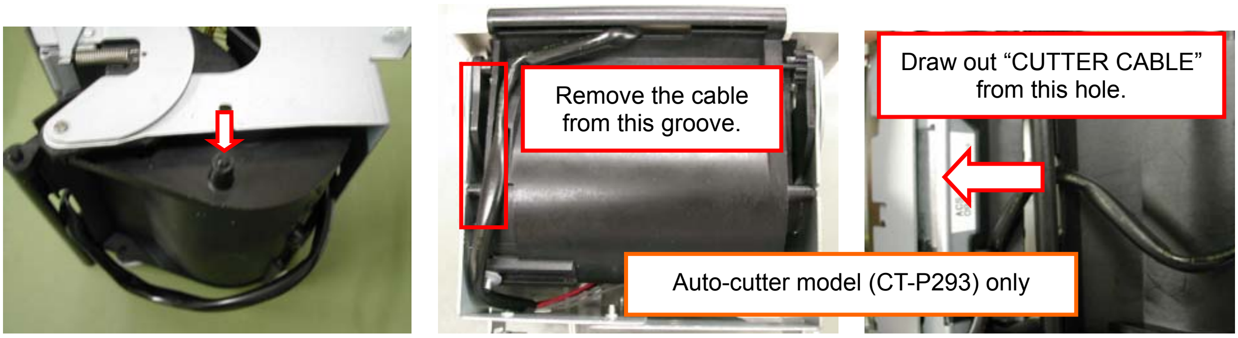
Remove “SCREW, PHT (BT#3), M3.0 × 8”, that fasten “SA, FRAME BASE” and “SA, HOLDER PAPER”, from the right and left sides, respectively.



<Precaution at reassembly>

Securely fit the bosses at “SA, HOLDER PAPER” into the slots at “SA, FRAME BASE”.

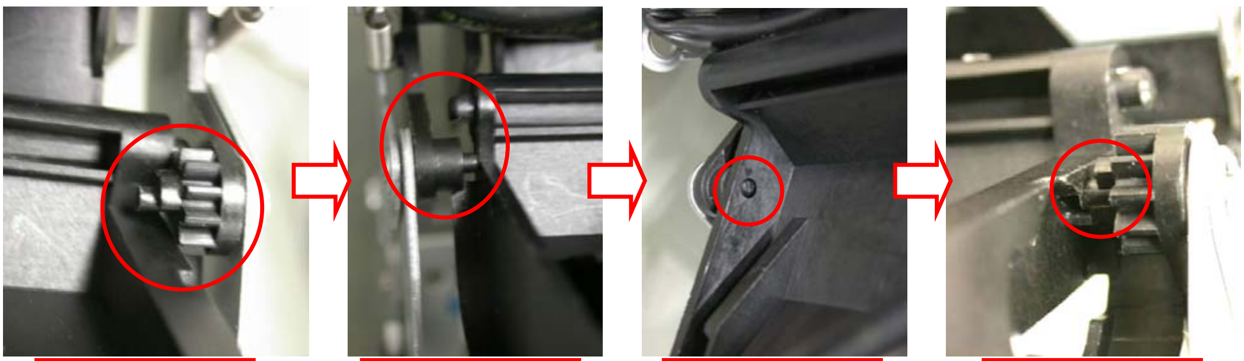
Remove “CUTTER CABLE” from the groove at “SA, HOLDER PAPER”, and draw it out from the hole. Move “SA, HOLDER PAPER” along the groove at “SA, FRAME BASE” and remove it.



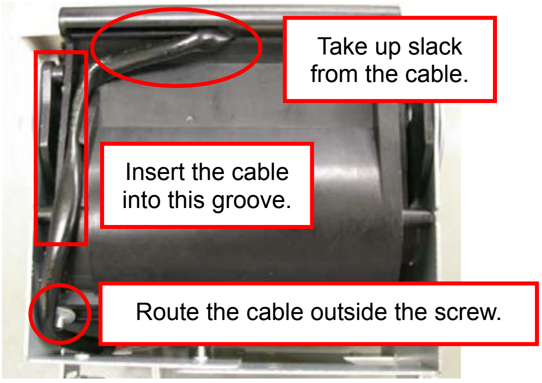
<Precaution at disassembly / reassembly>

Fit the boss at “FRONT DOOR ASSY” into the hole at “SA, HOLDER PAPER”.

Fit the boss in the following procedure.



Fit the projection at the gear here. → Fit the opposite boss here. → Fit the boss into the hole. → Fit the boss into the hole.



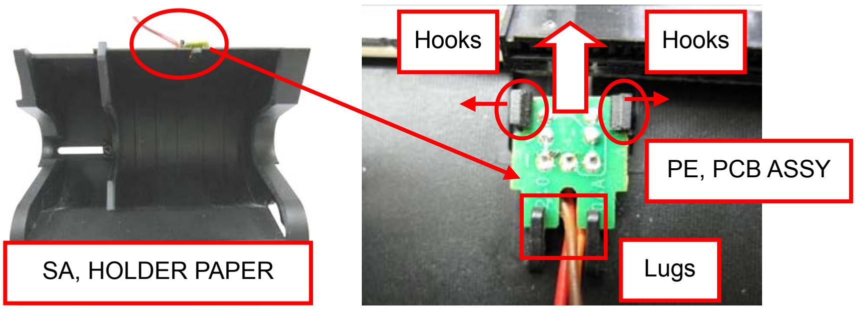
Auto-cutter model (CT-P293) only

<Precaution at disassembly / reassembly>

For the auto-cutter model, route the cable outside the screw for “GUIDE, PAPER ADJUST”, and insert it into the groove at “SA, HOLDER PAPER” without any slack on the cable.

Remove “PE, PCB ASSY” from “SA, HOLDER PAPER”.

Pull the hooks at the right and left outwardly, detach the lower lugs and pull “PE, PCB ASSY” upwardly to remove it.



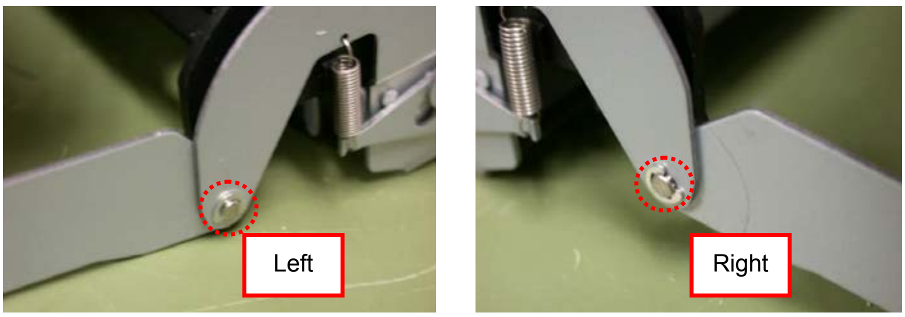
<Precaution at disassembly / reassembly>

When disassembling, do not pull the hooks excessively. Doing so may damage them.

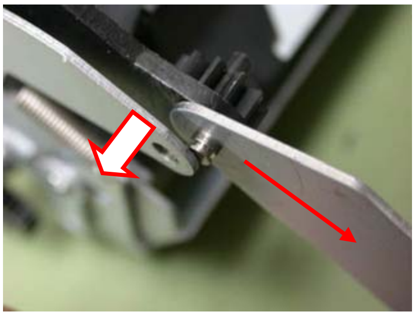
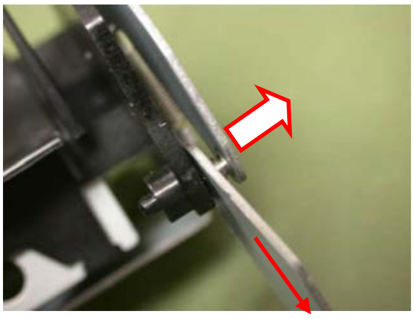
When reassembling, insert “PE, PCB ASSY” while fitting the lugs first and then the hooks.

2. Disassembling “SA, FRONT DOOR ASSY”

Remove “E-RING, 2.0”, that fasten “SA, FRONT DOOR ASSY” and “SA, FRAME BASE”, from the right and left sides.



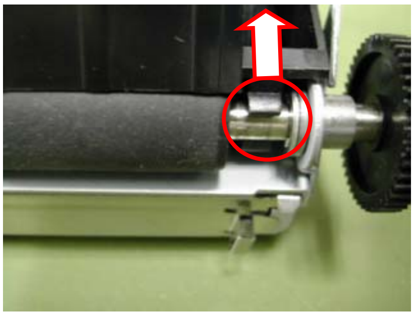
Detach the boss at “SA, FRAME BASE” from “FRAME, FRONT DOOR” while pulling “FRAME, FRONT DOOR” outwardly.

Detach two lugs that fasten “GUIDE FRONT DOOR”.

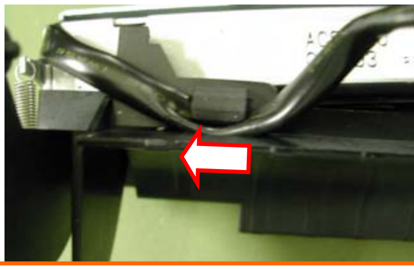
Detach two lugs from the right and left sides of the platen roller.



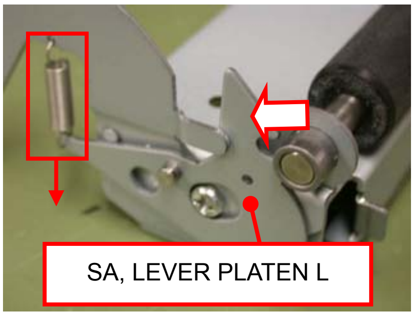
<Precaution at disassembly / reassembly>

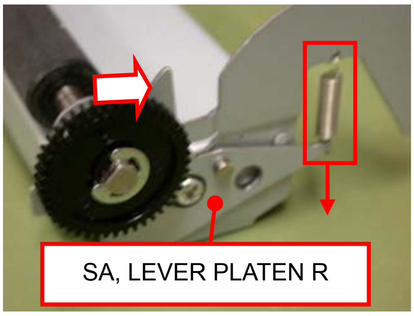
For the auto-cutter model, the cable is secured with the hook at “GUIDE FRONT DOOR”. When removing the cable, remove it while pushing the hook in the arrow direction. When attaching the cable, make it flat and insert it into the hook while pulling the cable toward the connector side to avoid slack on the cable.

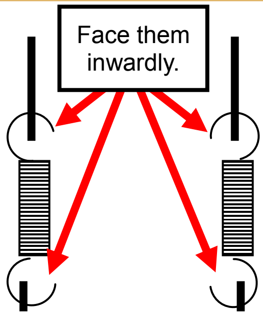


Auto-cutter model (CT-P293) only

Remove “SPRING, PLATEN LOCK” from the right and left sides of “FRAME, FRONT DOOR”.







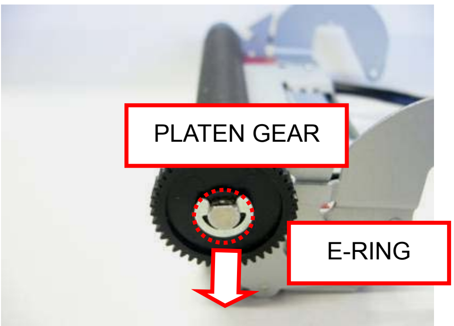
<Precaution at reassembly>

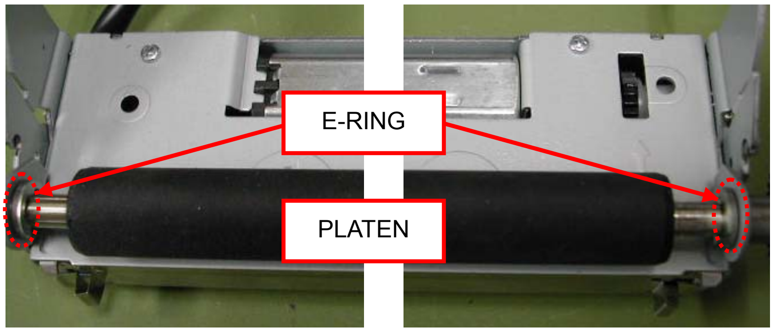
When reassembling, keep the end of “SPRING, PLATEN LOCK” facing inwardly under the “FRAME, FRONT DOOR”. Press “SA, LEVER PLATEN L & R” and check that they can be moved smoothly.

3. Disassembling “PLATEN”

Remove “E-RING, 4.0” that fasten “PLATEN GEAR”, and pull out “PLATEN GEAR”.

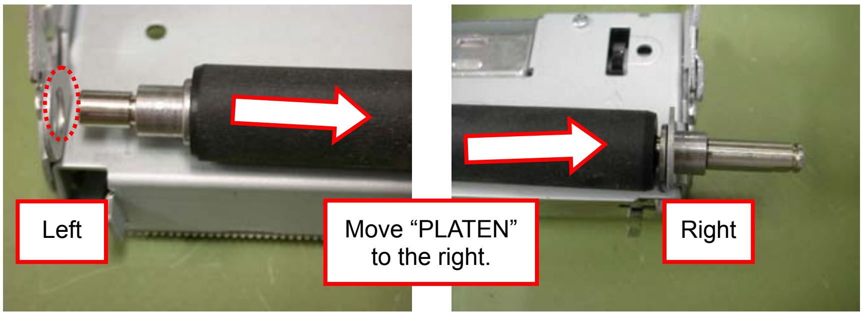
Remove two “E-RING, 4.0” that fasten “PLATEN” and “PLATEN BUSH” at the right and left sides.

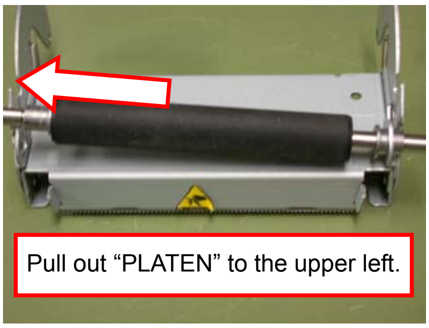


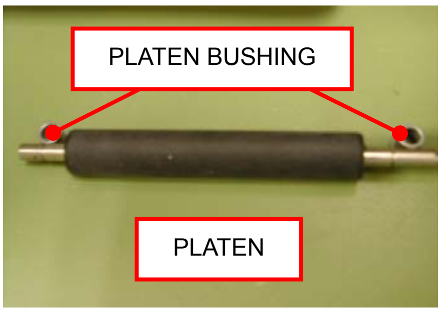


Move “PLATEN” to the right and pull it out from the shaft support at “FRAME, FRONT DOOR”.

When removing “PLATEN”, pull it out together with “PLATEN BUSHING” to the upper left.





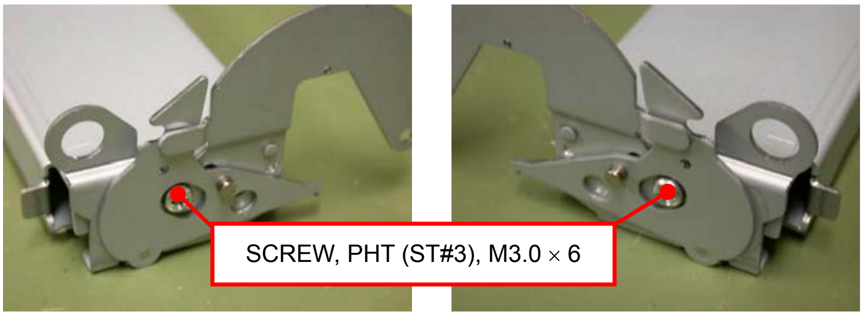


<Precaution at reassembly>

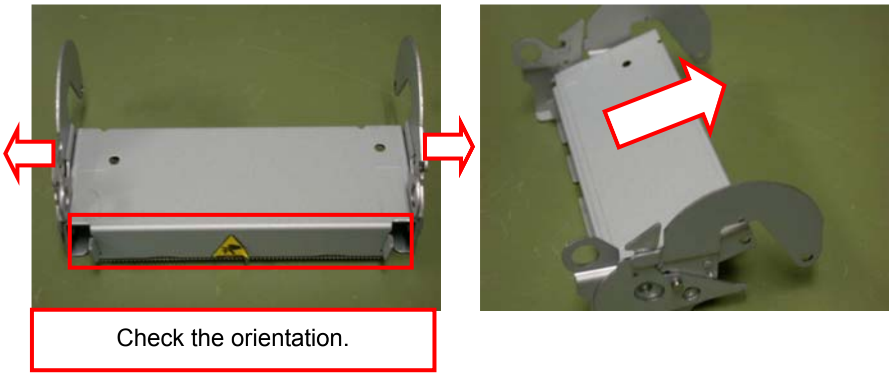
When reassembling, insert “PLATEN”, together with “PLATEN BUSHING”, into “FRAME, FRONT DOOR” from the right. Since the shaft length of “PLATEN” differs between the right and left, be careful not to insert “PLATEN” in a wrong orientation.

4. Disassembling “AUTO CUTTER” (CT-P293) or “DUMMY, CUTTER FRAME” (CT-P292)

Remove two “SCREW, PHT (ST#3), M3.0 × 6”, that fasten “FRAME, FRONT DOOR”, from the right and left sides.

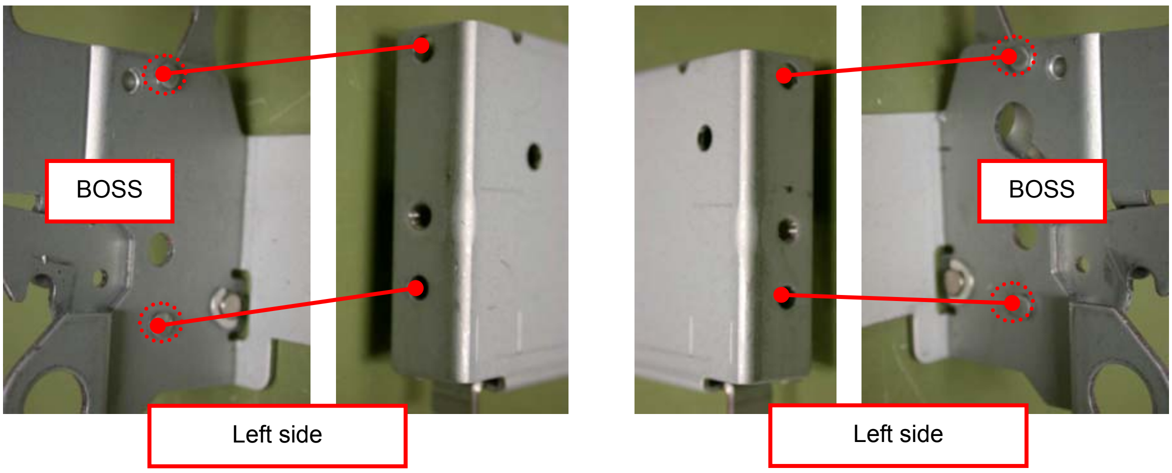


Slide “CUTTER” or “DUMMY, CUTTER FRAME”, and remove it while holding the side frames of “FRAME, FRONT DOOR” outwardly.

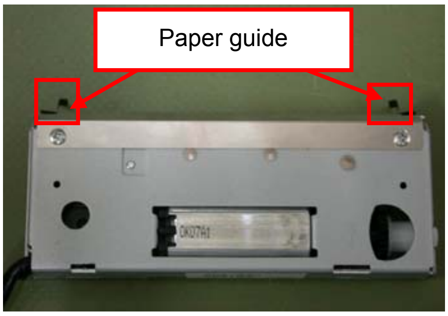


<Precaution at reassembly>

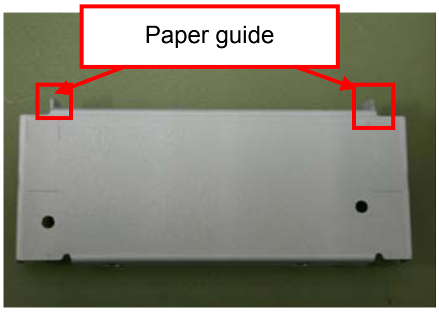
When reassembling, pull “FRAME, FRONT DOOR” outwardly and slide “CUTTER” or “DUMMY, CUTTER FRAME” onto “FRAME, FRONT DOOR” from a slanting direction.
Align the holes with the internal bosses at the right and left sides of “FRAME, FRONT DOOR”.
Check the mounting orientation. (The paper guide faces the “PLATEN” side.)



AUTO CUTTER (CT-P293)

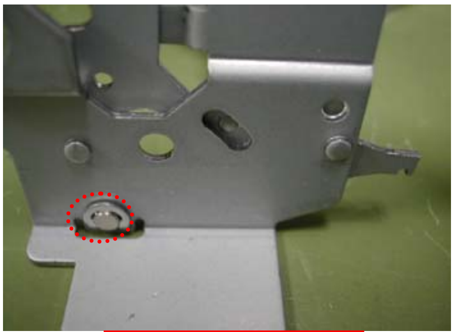


DUMMY, CUTTER FLAME (CT-P292)

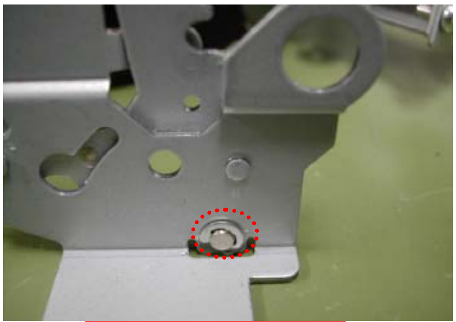


5. Disassembling “SA, LEVER PLATEN L & R”

Remove two “E-RING, 2.0” from the right and left sides of “FRAME, FRONT DOOR”.



Left side



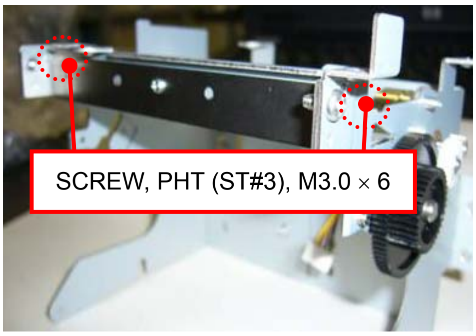
Right side

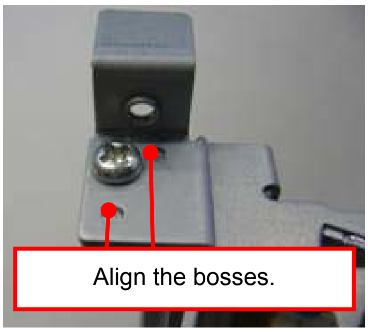
<Precaution at reassembly>

Be sure to assemble “SA, LEVER PLATEN” in a correct orientation.

6. Disassembling “SA, F BLADE STAY”

Remove two “SCREW, PHT (ST#3), M3.0 × 6” that fasten “SA, FRAME BASE” and “SA, F BLADE STAY”.

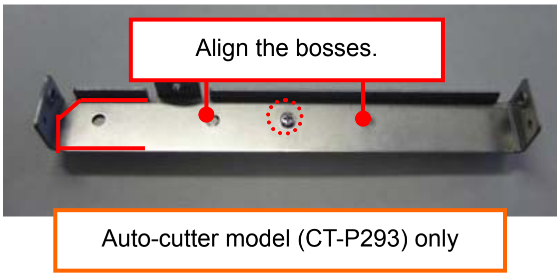




<Precaution at reassembly>

Align the bosses at “SA, F BLADE STAY” with the holes at “SA, FRAME BASE”.

Remove “SCREW BHT (ST), M2.0 × 4” that fastens “SA, F BLADE STAY” and “F-BLADE”.

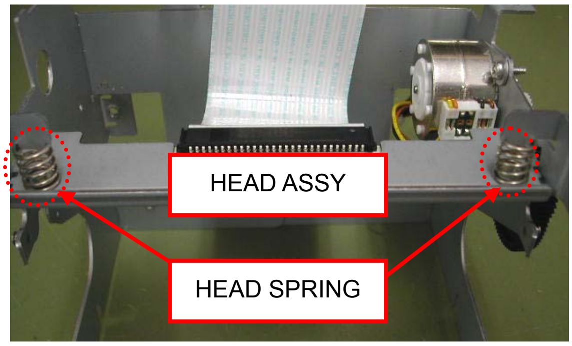


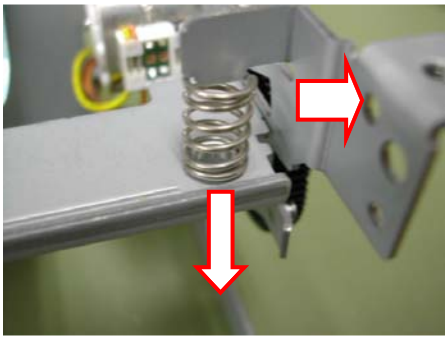
<Precaution at reassembly>

Align the bosses at “F BLADE STAY” with the holes at “SA, FRAME BASE”. Check the orientation of “F-BLADE”.

7. Disassembling “HEAD ASSY”

Remove “HEAD ASSY” while pulling the side edges at “SA, FRAME BASE” outwardly and keeping it clear of “HEAD SPRING”.





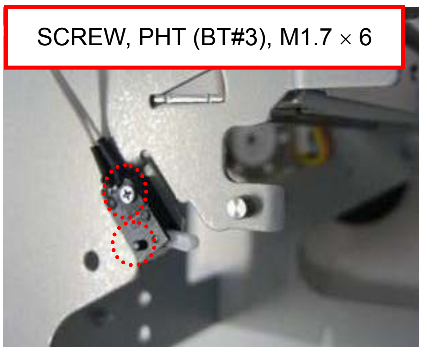
<Precaution at disassembly / reassembly>

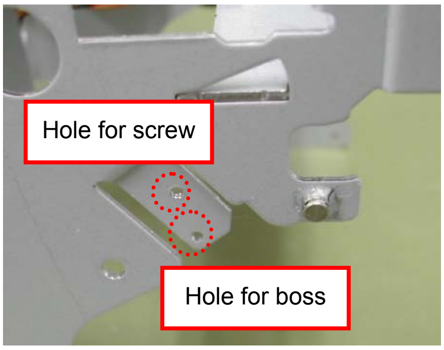
When disassembling, be careful not to loose “HEAD SPRING”. When reassembling, mount “HEAD ASSY” first and “SA, BLADE STAY” next. Then insert two “HEAD SPRING”. Check that “HEAD ASSY” is correctly inserted into “SA, FRAME BASE” and that the bosses at “HEAD ASSY” are located inside “HEAD SPRING”.

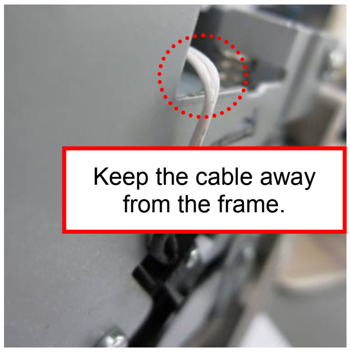


8. Disassembling "PE SWITCH ASSY"

Remove "SCREW, PHT (BT#3), M1.7 × 6" that fastens "SA, FRAME BASE" and "PE SWITCH ASSY".







<Precaution at reassembly>

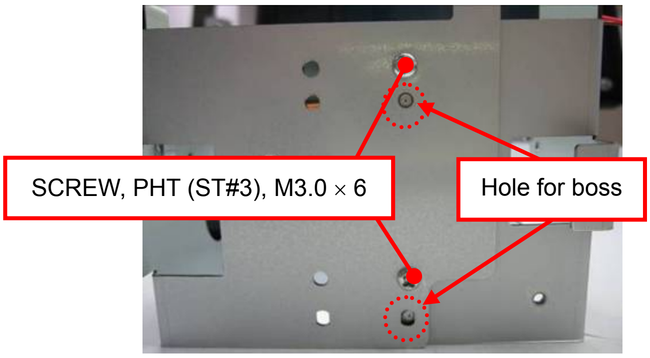
When reassembling, align the screw and the boss with the holes for them, respectively, then tighten the screw.

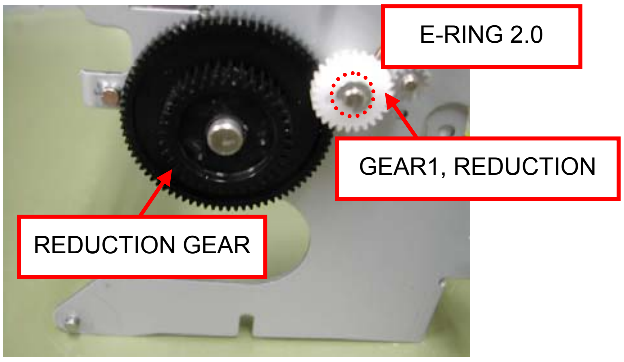
Keep the cable away from the frame.

9. Disassembling "SA, FRAME BASE"

Remove two "SCREW, PHT (ST#3), M3.0 × 6" that fasten "SA, FRAME BASE R & L".

Remove "E-RING, 2.0" and detach "GEAR1, REDUCTION" from "SA, FRAME BASE R". Then remove "REDUCTION GEAR".



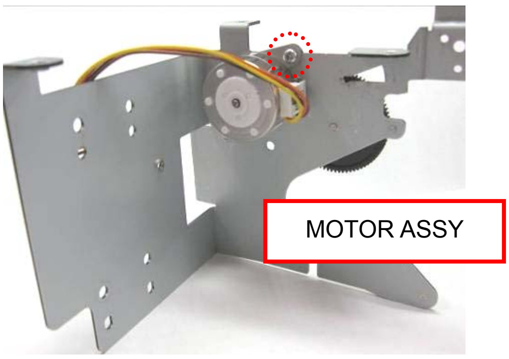


<Precaution at reassembly>

Align the bosses at "SA, FRAME BASE L" with the holes at "SA, FRAME BASE R".

10. Disassembling "MOTOR ASSY"

Remove "SCREW, PHT (ST#3), M3.0 × 6" that fastens "SA, FRAME BASE R" and "MOTOR ASSY".





<Precaution at reassembly>

Turn “MOTOR ASSY” and insert the lower flange into the fixture. Then secure “MOTOR ASSY” with a screw.

1-3. Assembly Procedure

When reassembling the parts, follow the procedure of “1-2 Disassembly Procedure” in reverse.

1-4. Oiling

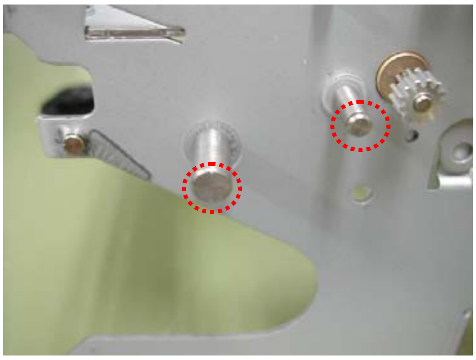
1) Oil Used (Grease)

- FLOIL G-602S (Kanto Kasei)

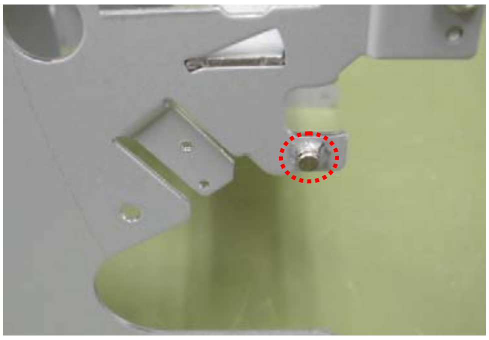
2) Oiling Positions

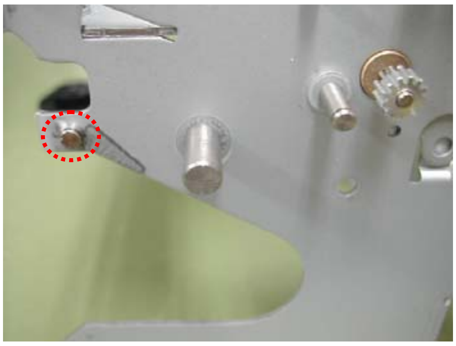
(1) Pins at the gear on “SA, FRAME BASE R” (2 positions)



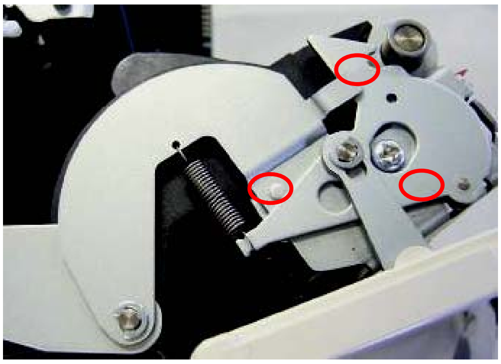


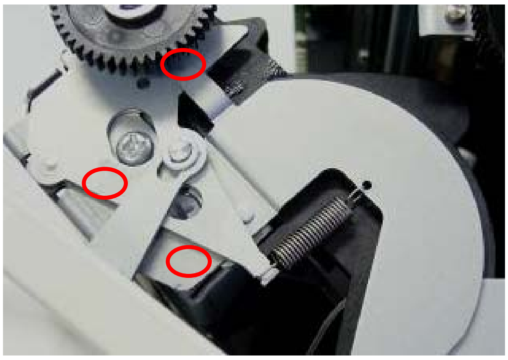
(2) Mating section of “SA, FRAME BASE R & L” and “SA, LEVER PLATEN R & L”





(3) Slideways at “SA, FRAME FRONT DOOR” and “SA, LEVER PLATEN R & L”





(4) Edges at “CUTTER F- BLADE”, slideways for “FIX BLADE”

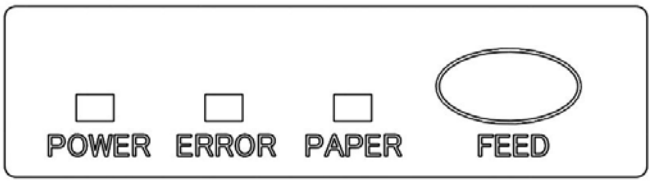


2. TROUBLESHOOTING

2-1. Error Indication

When an error is detected, the three LEDs indicate the error status in the following patterns.

LED on the panel



1) POWER LED (green)

Lit: Power supplied

Blinking: Memory check error, hex-dump mode, memory switch setting mode

Not lit: Power not supplied

2) ERROR LED (red)

Lit: Cover open, paper end

Blinking: Occurrence of an error, waiting for macro execution

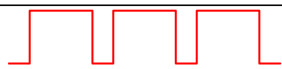
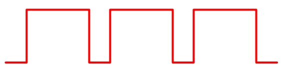
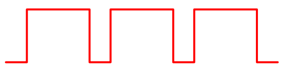
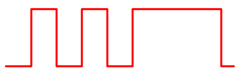
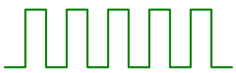
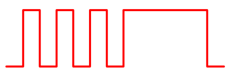
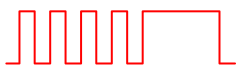
Not lit: Normal operation

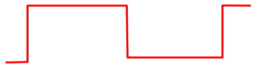
3) PAPER LED (orange)

Lit: Paper end

Blinking: Not blink

Not lit: Normal operation

Status	POWER LED (Green)	ERROR LED (Red)	PAPER LED (Orange)
Head overheat	Lit		–
Cover open error *1 (MSW3-8 is set to OFF.)	Lit		–
Cover open error *2 (MSW3-8 is set to ON.)	Lit		–
Cutter lock error	Lit		–
Memory check error		–	–
Low voltage error	Lit		–
High voltage error	Lit		–

Status	POWER LED (Green)	ERROR LED (Red)	PAPER LED (Orange)
Paper end	Lit	–	Lit
Macro execution wait	Lit		

*1, 2: When the front cover is opened during paper feed or printing, the paper sensor may be activated, resulting in the paper end error.

*2: After closing the front cover, reset the error by using a command.

2-2 Explanations of Error Conditions

2-2-1 Head Overheat Error

When the head temperature is raised (approx. 75°C or above), the ERROR LED blinks and printing operation is stopped to protect the print head from overheat.

When the head temperature is lowered (approx. 70°C or lower), printing operation is automatically restarted.

2-2-2 Cover Open Error

When the front cover is opened during paper feed or printing, the ERROR LED blinks.

When MSW3-8 is set to OFF: The error is reset when the front cover is closed (auto restore).

When MSW3-8 is set to ON: The error is reset when the front cover is closed and a command is given.

Note: When the front cover is opened during paper feed or printing, the paper sensor may be activated, resulting in the paper end error.

2-2-3 Cutter Lock Error

The cutter cannot be moved. An error has occurred.

To reset the error, remove the cause of the error, and press the FEED switch or give a command.

2-2-4 Memory Check Error

Memory read/write check operation is not correctly performed. (Restoration not possible)

2-2-5 Low Voltage Error

The voltage supplied to the printer drops.

When this error occurs, immediately turn the power off. (Restoration not possible)

2-2-6 High Voltage Error

The voltage supplied to the printer rises excessively.

When this error occurs, immediately turn the power off. (Restoration not possible)

2-2-7 Paper End

When the paper has run out, the paper sensor in the paper path is activated, the ERROR and PAPER LEDs light up, and then printing operation is stopped.

Open the front cover and set new paper.

2-2-8 Macro Execution Wait

When the ESC/POS command is specified, the macro execution wait state will take effect. Press the FEED switch.

2-3. Troubleshooting Procedure

When a fault occurs, confirm its phenomenon, locate the problem in accordance with “2.2 Troubleshooting Guide”, and troubleshoot it as described below.

Phenomenon	Find the fault phenomenon in this column. If there are multiple phenomena, take all the applicable items into consideration. This will help you locate hidden problems as well.
Cause	Possible causes are listed here. Find probable causes from the list and follow the check method to identify the cause of the fault.
Check Method	The check method for identifying the cause of the fault is described.
Remedies	Take the remedies described in this column.

By following the above-mentioned procedure, you can troubleshoot problems efficiently with fewer misjudgments.

2-4. Troubleshooting Guide

● Power Supply Failure

Phenomenon	Cause	Check Method	Remedies
Power cannot be turned on. (The POWER LED not illuminated.)	The power cable is not connected. (AT model) The main power of the power source is off.	Check if the plug is correctly connected. Check if the main power is turned on.	Connect the power cable. Turn the main power on.
	A cable is disconnected.	Check if a cable at the power supply line is disconnected using a tester.	Replace the wire connected from the power source with a new one. Modify the damaged wire.
	The control PCB is faulty.	–	Replace “UNIT, MAIN PCB”.

● Printing Failure

Phenomenon	Cause	Check Method	Remedies
No printing	The control PCB is faulty.	–	Replace “UNIT, MAIN PCB”.
	The thermal head connector has a bad contact or connection.	Check the contact or connecting condition.	Re-insert the thermal head connector or replace it with a new one.
	The thermal head is faulty.	–	Replace the thermal head with a new one.
	Paper setting is wrong side out.	Check the paper orientation.	Set the paper correctly.
Part of printing is not done.	The thermal head connector has a bad contact or connection or faulty mounting.	Check the contact, connecting or mounting condition.	Re-insert the thermal head connector or “HEAD ASSY”.
	The thermal head is faulty.	–	Replace the thermal head with a new one.
Print is pale. Print is uneven. Print is faint.	The supply voltage is low.	Check the supply voltage with a tester.	Use the printer within the specified supply voltage range.
	The thermal head is faulty.	–	Replace the thermal head with a new one.
	The thermal head has fouling.	Check the thermal head for fouling.	Remove fouling using ethyl alcohol soaked cotton swab or soft cloth.
	Paper other than recommended is used.	Check if the paper being used meets the specification.	Replace it with the specified paper.
	The platen roller is not mounted correctly.	Check the mounting condition of the platen roller.	Mount the platen roller correctly.

● Paper Feed Failure

Phenomenon	Cause	Check Method	Remedies
Paper is not fed. Paper feed is not straight.	The motor connector has a bad connection.	Check the connecting condition of the connector.	Connect the connector correctly.
	The motor is faulty.	Measure the supply voltage with a tester or oscilloscope.	Replace “MOTOR ASSY”.
	The supply voltage is low.	Check the supply voltage with a tester.	Use the printer within the specified supply voltage range.
	The control PCB is faulty.	–	Replace “UNIT, MAIN PCB”.
	The platen roller is not mounted correctly.	Check the mounting condition of the platen roller.	Mount the platen roller correctly.
	Paper feed is faulty.	Check if paper is jammed, torn or caught in the paper path.	Remove unnecessary paper and set the paper correctly.
	Foreign substances are stuck in the gear. A gear is broken.	Check the gear for any foreign substance or breakage.	Eliminate foreign substance. If any gear is broken, replace it with a new one.

● Faulty Sensor

Phenomenon	Cause	Check Method	Remedies
Paper presence or absence cannot be detected. Paper near end cannot be detected.	The paper sensor is faulty.	Check the indication at the LCD or LED when the paper ends.	Replace “SA, PE PCB”.
An error cannot be reset.	The sensor at the operation panel cover is faulty.	Correctly attach the operation panel cover and check again.	Replace “UNIT, MAIN PCB”.
	The front cover switch is faulty.	After setting paper and closing the front cover, check if the error is reset.	Replace the front cover switch.

● Auto Cutter Failure (CT-P293)

Phenomenon	Cause	Check Method	Remedies
The auto cutter does not operate.	The connector has a bad connection.	Check the connecting condition of the connector at the control PCB.	Connect the connector correctly.
	The auto cutter is faulty.	Measure the supply voltage with a tester or oscilloscope.	If the supply voltage is normal, replace the auto cutter with a new one.
	The control PCB is faulty.	–	Replace “UNIT, MAIN PCB”.
	Paper feed is faulty. (paper jams)	Check if paper is jammed, torn or caught in the paper path.	Remove unnecessary paper and set the paper correctly.

3. SERVICE PARTS LIST

Remarks: All the parts used in the product are contained in "SERVICE PARTS LIST" in this Service Manual. However, note that all of them are not available with customers.

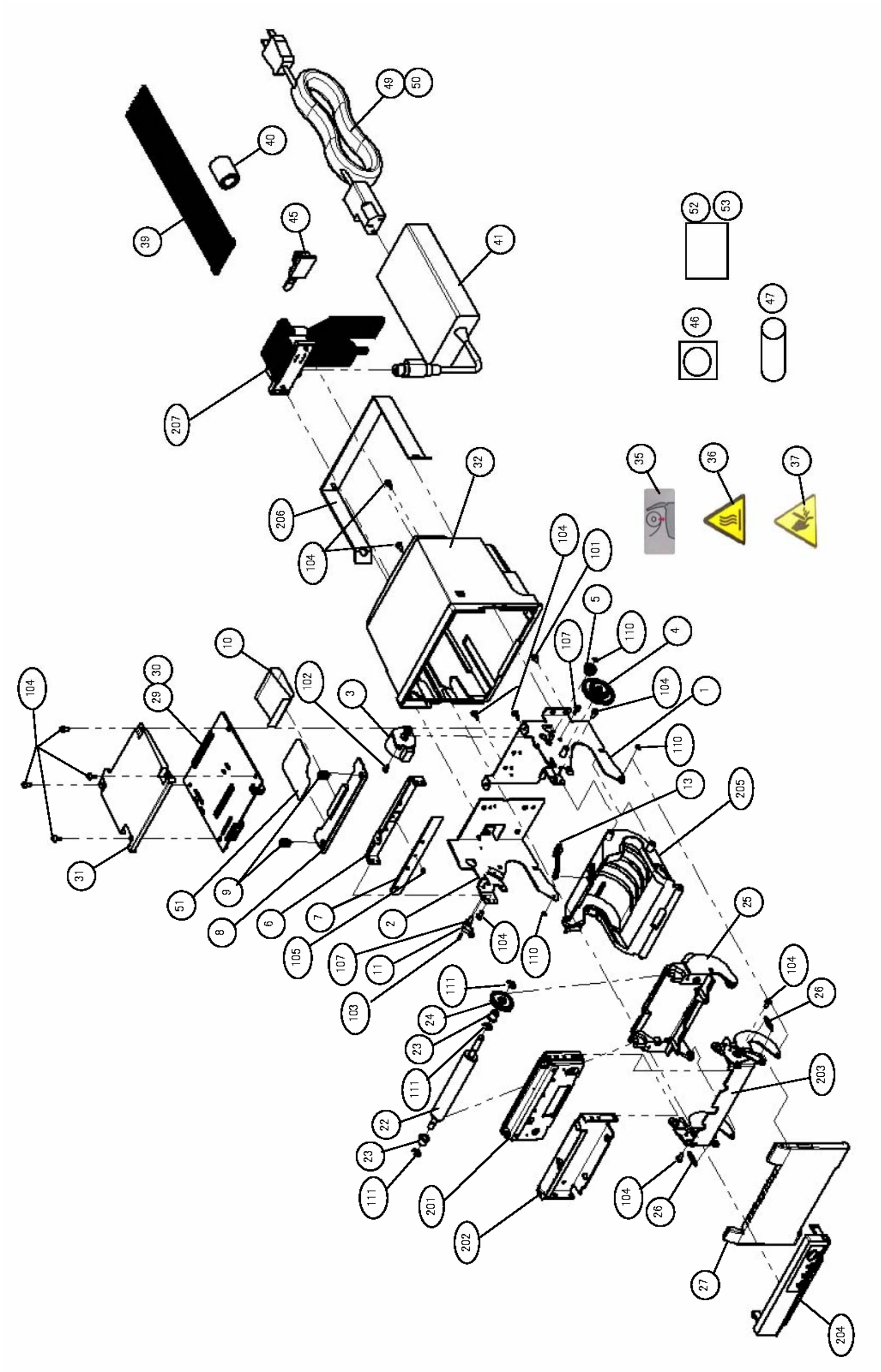
When placing an order for service parts, refer to the Parts Price List published separately. If you need the Parts Price List, consult the local distributor from whom you purchased this product.

No.	Part No.	Part Name		Q'ty	Remarks
1		SA, FRAME BASE R		1	Not supplied
2		SA, FRAME BASE L		1	Not supplied
3	DW25901-00F	CUTTER STEP MOTOR ASSY		1	
4	600377-00	REDUCTION GEAR (CTS-300)		1	
5	ZH20201-00F	GEAR 1, REDUCTION		1	
6		STAY, F BLADE		1	Not supplied
7	(500318-00)	(F-Blade-31 SEC3699)		1	
8	100107-00	HEAD ASSY		1	
9	700021-00	HEAD SPRING (CTS-300)		2	
10	25-0347	FFC (SEC2310)		1	
11	200036-000	PE Switch Assy (SEC3789)		1	
12			HOLDER, PAPER	1	Not supplied
13	ZH66702-00F	SA, PE PCB		1	
14			GUIDE, PAPER ADJUST	1	Not supplied
15			FRAME, FRONT DOOR	1	Not supplied
16			SA, LEVER PLATEN L	1	Not supplied
17			SA, LEVER PLATEN R	1	Not supplied
18			ACS530 Cutter (with Fix Brade)	(1)	for CT-P293 Not supplied
19			DUMMY, CUTTER FRAME	(1)	for CT-P292 Not supplied
20			CUTTER, MANUAL	(1)	for CT-P292 Not supplied
21			GUIDE, EX PAPER	(1)	for CT-P293 Not supplied
22	800452-00	PLATEN (CTS-300)		1	
23	650001-00	PLATEN BUSHING (CTS-300)		2	
24	600376-00	PLATEN GEAR (CTS-300)		1	
25	ZH24203-00F	GUIDE, FRONT DOOR		1	
26	ZH43601-00F	SPRING, PLATEN LOCK		2	
27	ZH54202-00F	DOOR, FRONT		1	
28			RINK, FRONT DOOR	2	Not supplied
29	ZH66801-00F	UNIT, MAIN PCB (WITH ROM)		(1)	
30	ZH66802-00F	UNIT, MAIN PCB USB (WITH ROM)		(1)	for USB model
31		PLATE, SHIELD		1	Not supplied
32		CASE L		1	Not supplied
33			COVER, OPE-PANE	1	Not supplied
34			SHEET, OPE-PANE	1	Not supplied
35		CAUTION LABEL PAPER		1	Not supplied
36	80-0276	CAUTION HOT		1	
37			CAUTION EDGE	1	Not supplied

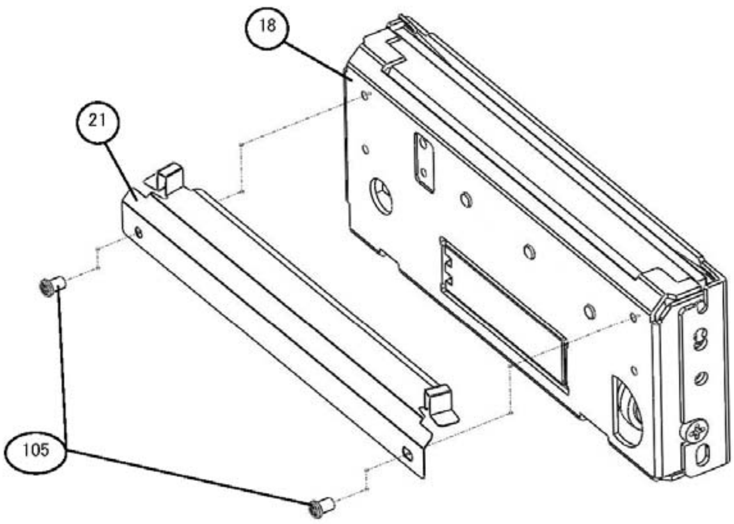
No.	Part No.	Part Name		Q’ty	Remarks
38			PLATE,MOUNTING 292	1	Not supplied
39	25-0355	CORD ASSY CA212-5		(1)	
40	ZH67901-00F	CORE, I/F CABLE		1	
41			36AD2-J	(1)	OPTION
42			SA, POWER BOARD	(1)	for AT model, Not supplied
43			COVER, POWER CON BOARD	(1)	for AT model, Not supplied
44			SA, I/F CABLE HOSIDEN	(1)	for AT model, Not supplied
45		CLAMP, WIRE		1	OPTION
46		CD-ROM, USER’S MANUAL JPN/ENG		1	OPTION
47		PAPER, ROLL		1	OPTION
48	ZH76701-00F	UNIT, BOX CTP290		1	
49			AC CORD J	(1)	for JAPAN, OPTION
50			AC CORD U	(1)	for USA, OPTION
51	TA44114-00F	COVER FF, OPE-PANE		1	
52		GUIDE, QUICK START JPN		(1)	OPTION
53		GUIDE, QUICK START ENG		(1)	OPTION
101	E11830-060F	SCREW, PHT (INT.TW) M3 × 6 (toothed lock)		1	
102	E11126-060F	SCREW, PH (ST#3) M2.6 × 6		1	
103	E11717-060F	SCREW, PHT (BT#3), M1.7 × 6		1	
104	E11130-060F	SCREW, PHT (ST#3), M3 × 6		12	
105	E14020-040F	SCREW, BHT (ST), M2 × 4		5	
106			SCREW, PHT, M3 × 12	1	Not supplied
107	E11730-080F	SCREW, PHT (BT#3), M3 × 8		2	
108			SCREW, PHT (ST#3), M3 × 12	2	Not supplied
109			SCREW, PHT (BT#3), M3 × 12	(2)	for AT model Not supplied
110	E60320-000F	E-RING, 2.0		7	
111	E60340-00F	E-RING, 4.0		3	
112			NUT, (#2) M3	1	Not supplied
201	ZH44710-00F	SA, ACS530 CUTTER		(1)	for CT-P293
202	ZH44709-00F	SA, DUMMY CUTTER		(1)	for CT-P292
203	ZH44708-00F	SA, FRONT DOOR FRAME		1	
204	ZH54701-00F	SA, OPE-PANE COVER		1	
205	ZH44707-00F	SA, HOLDER PAPER		1	
206	ZH74701-00F	SA, MOUNTING PLATE		1	
207	ZH67703-00F	SA, POWER BOARD-I/F CABLE HOSIDEN		(1)	for AT model

3-1. Mechanical Exploded Diagrams

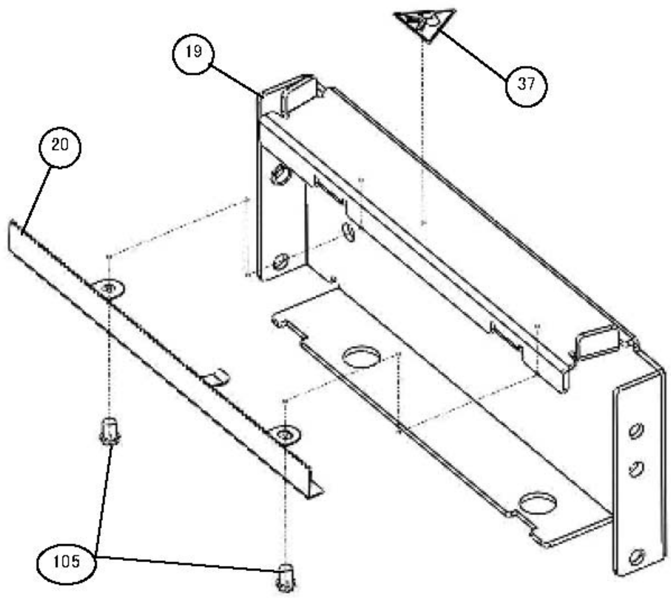
Overall exploded diagram



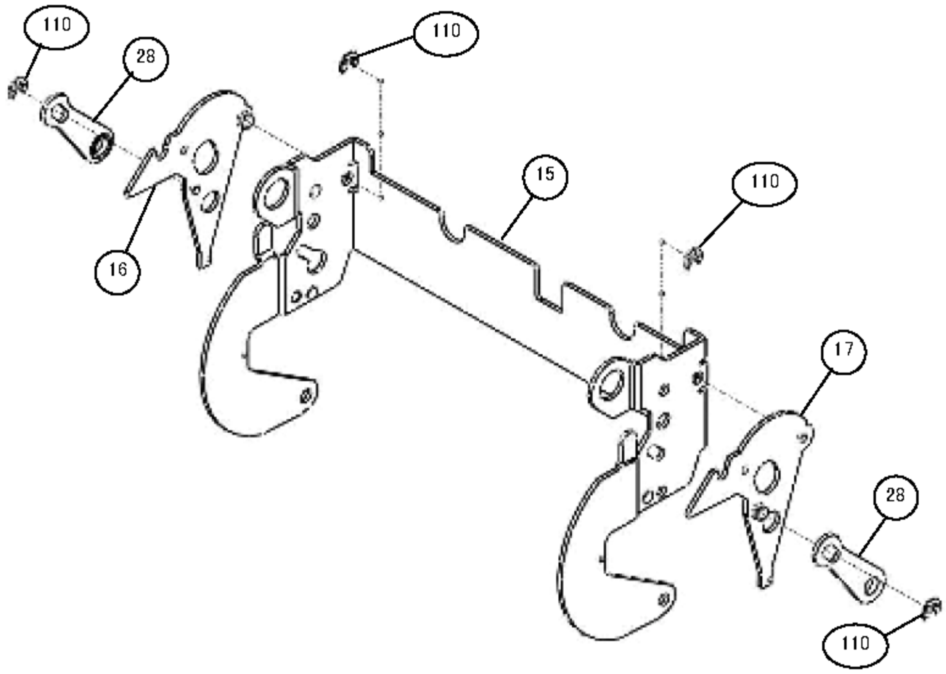
Exploded diagram - configuration of No. 201



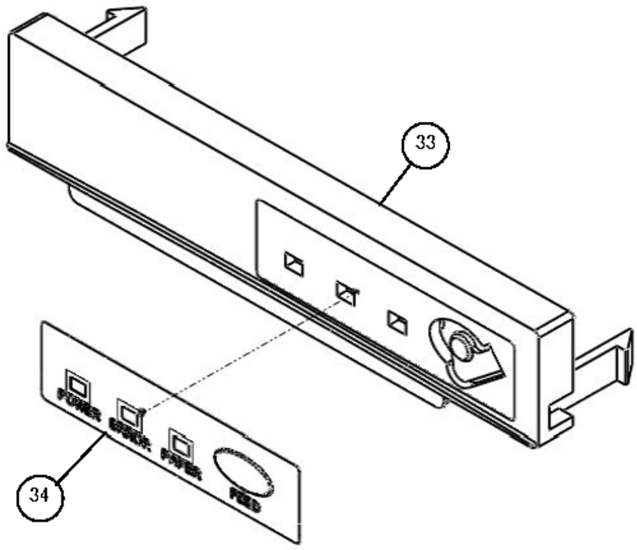
Exploded diagram - configuration of No. 202



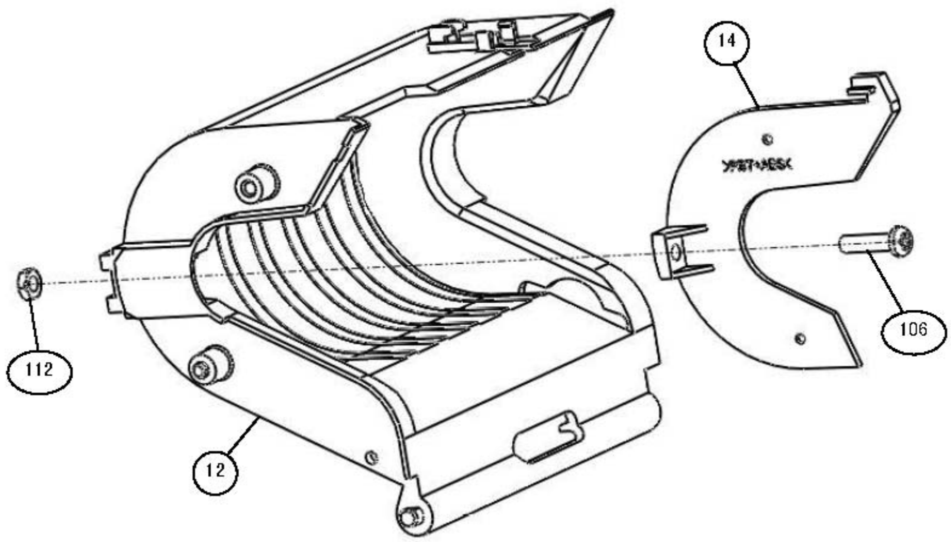
Exploded diagram - configuration of No. 203



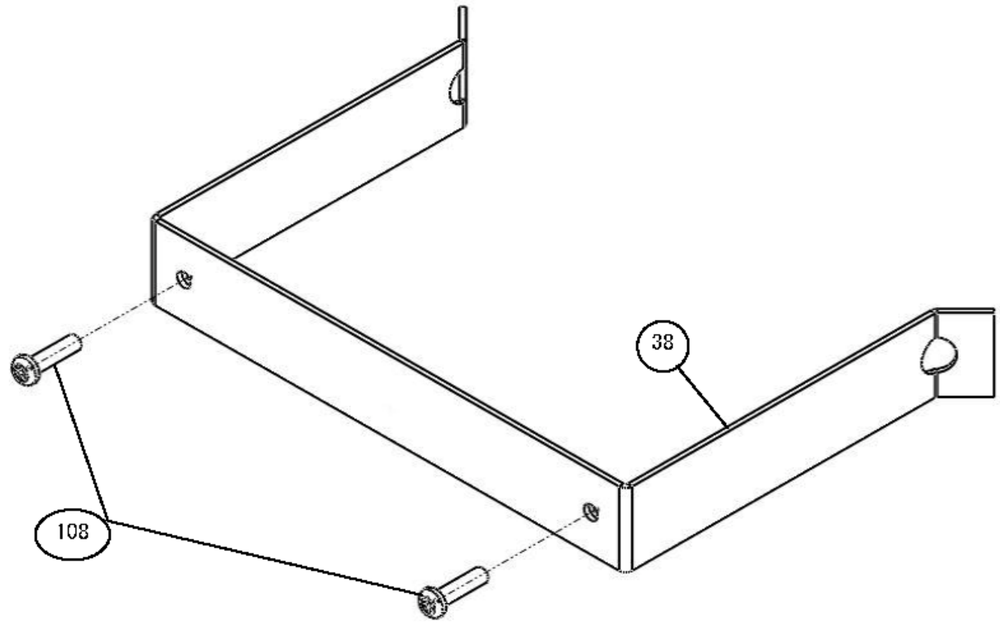
Exploded diagram - configuration of No. 204



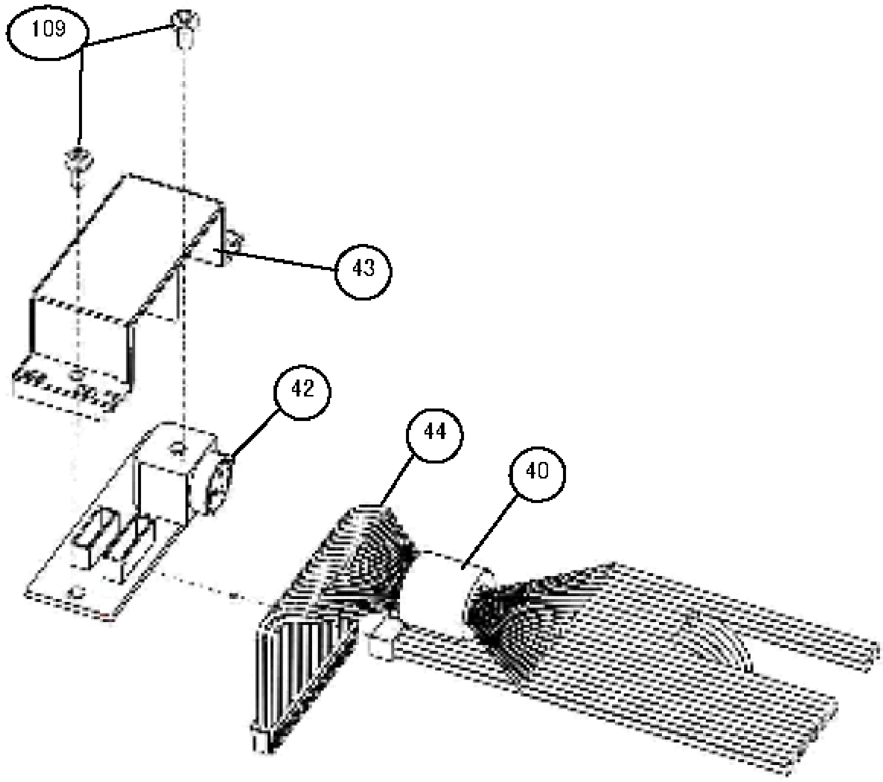
Exploded diagram - configuration of No. 205



Exploded diagram - configuration of No. 206



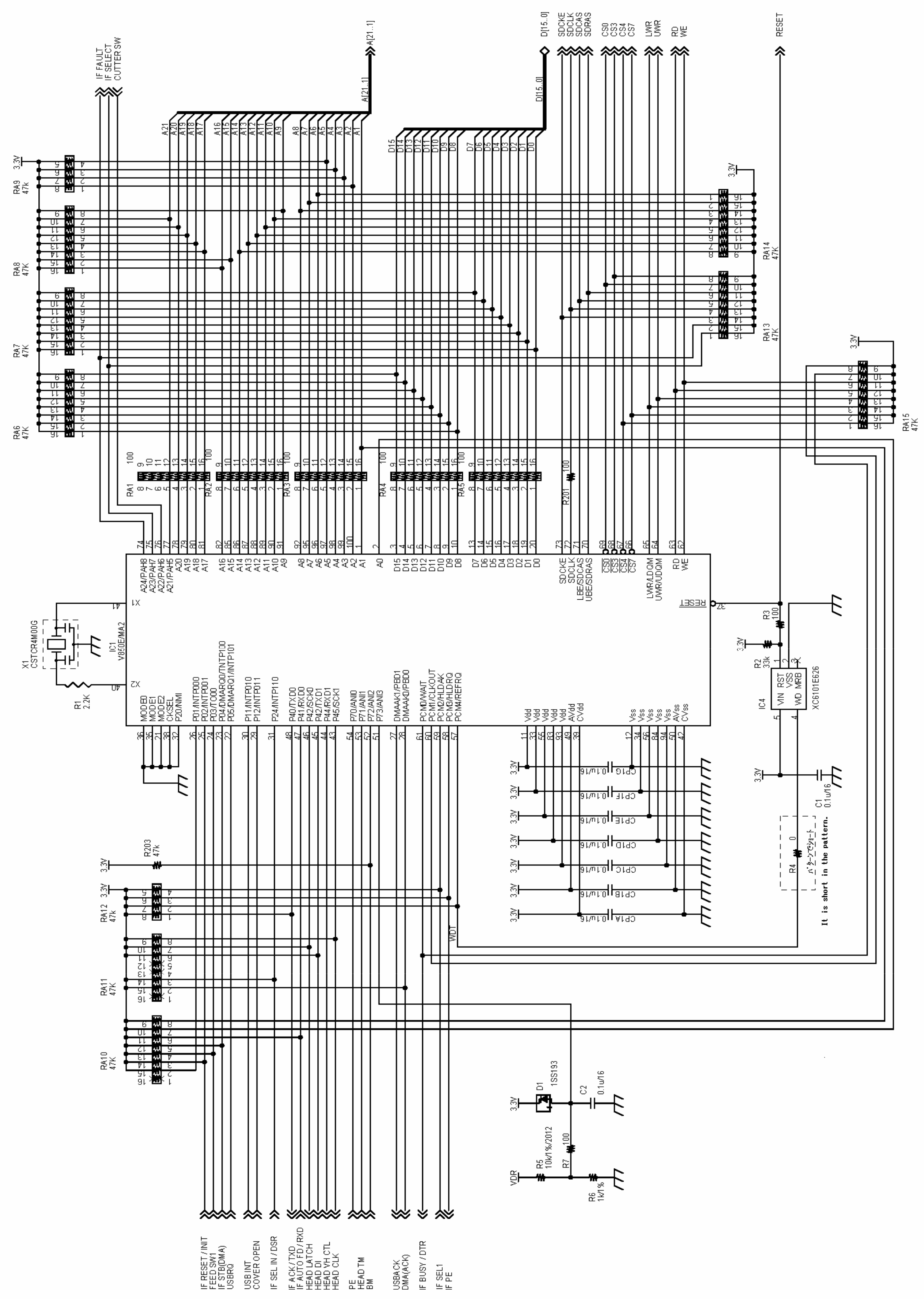
Exploded diagram - configuration of No. 207



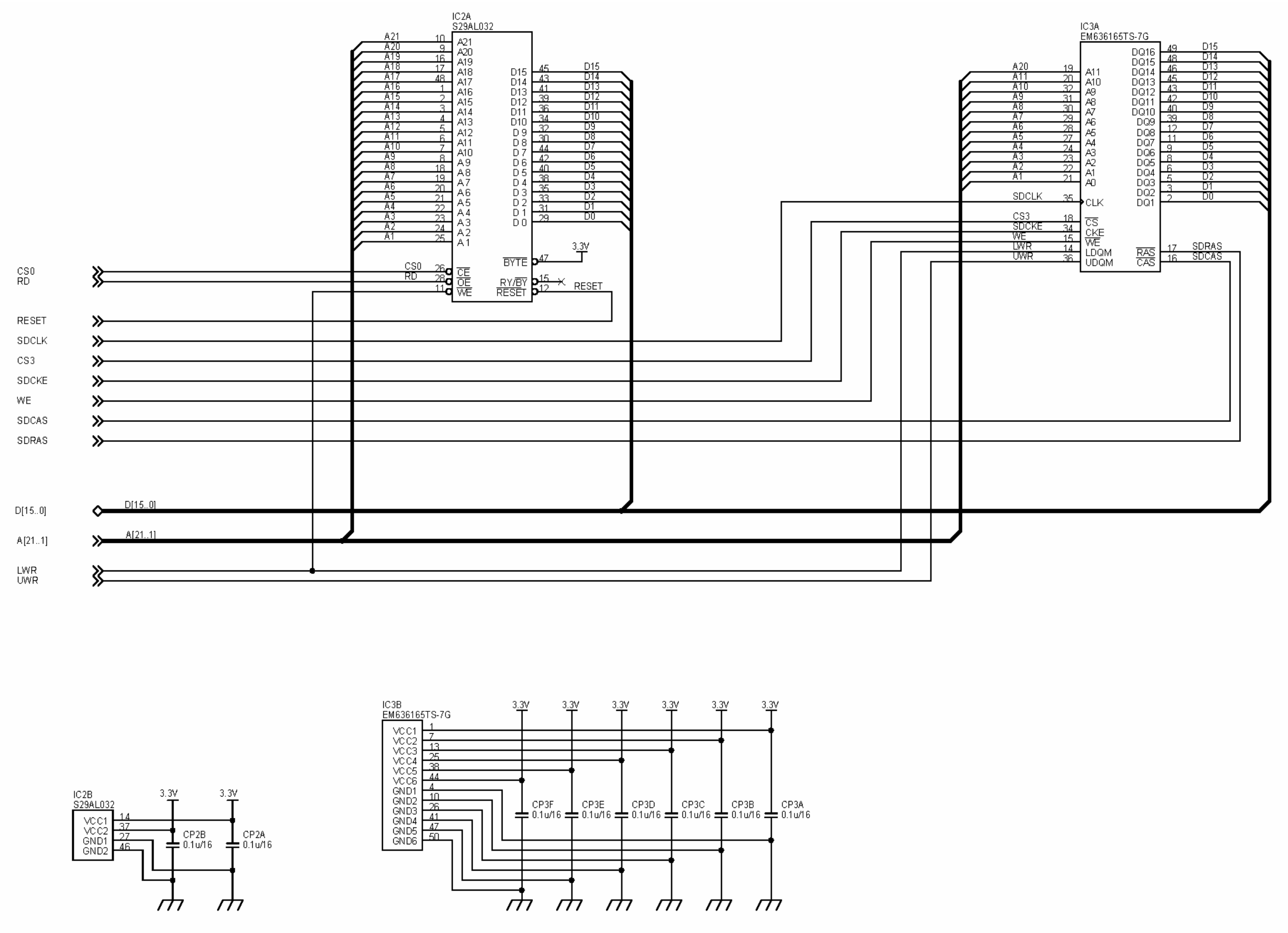
4. CIRCUIT DIAGRAMS

4-1. MAIN PCB

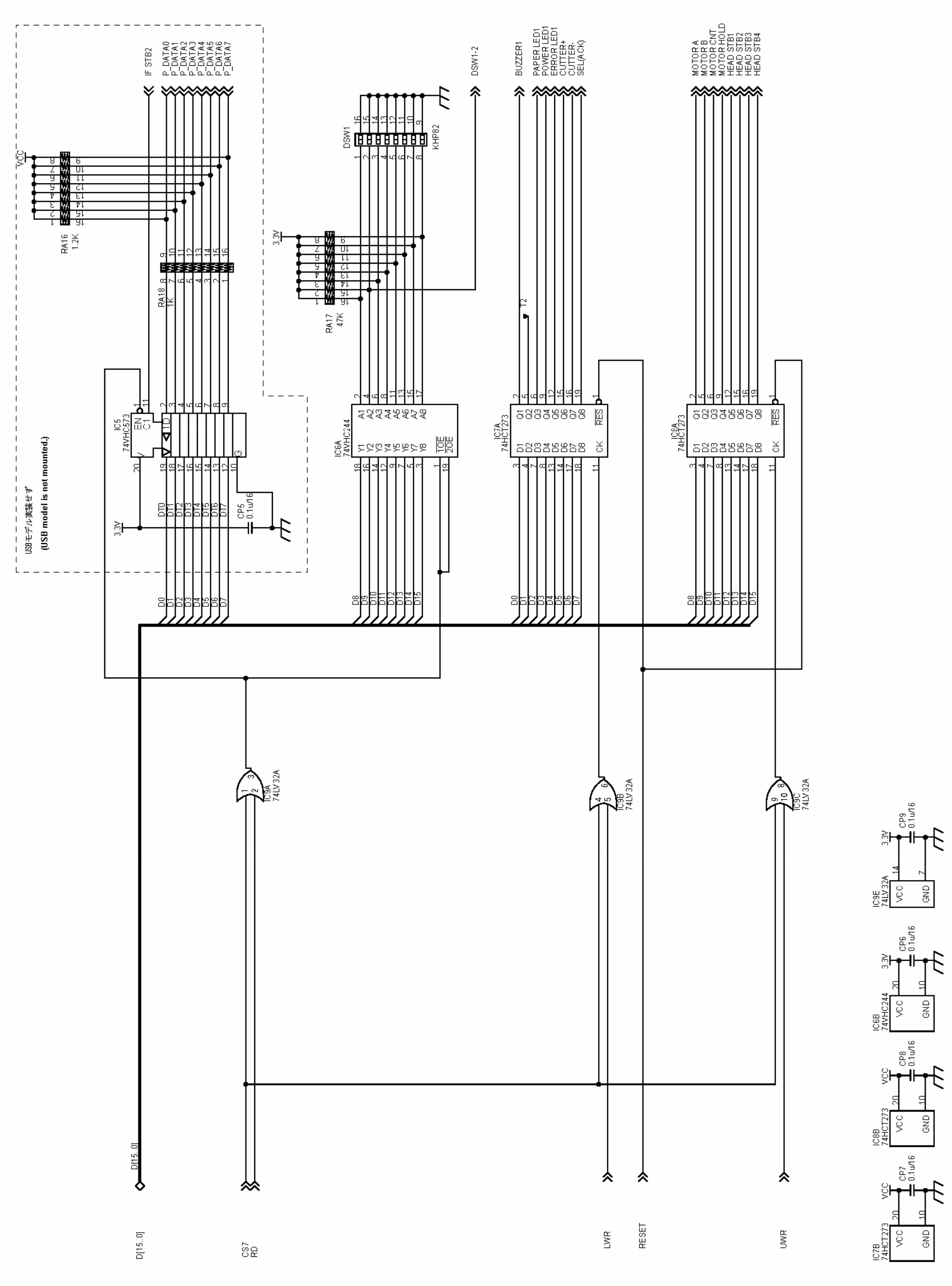
4-1-1. Main Control Board (CPU)



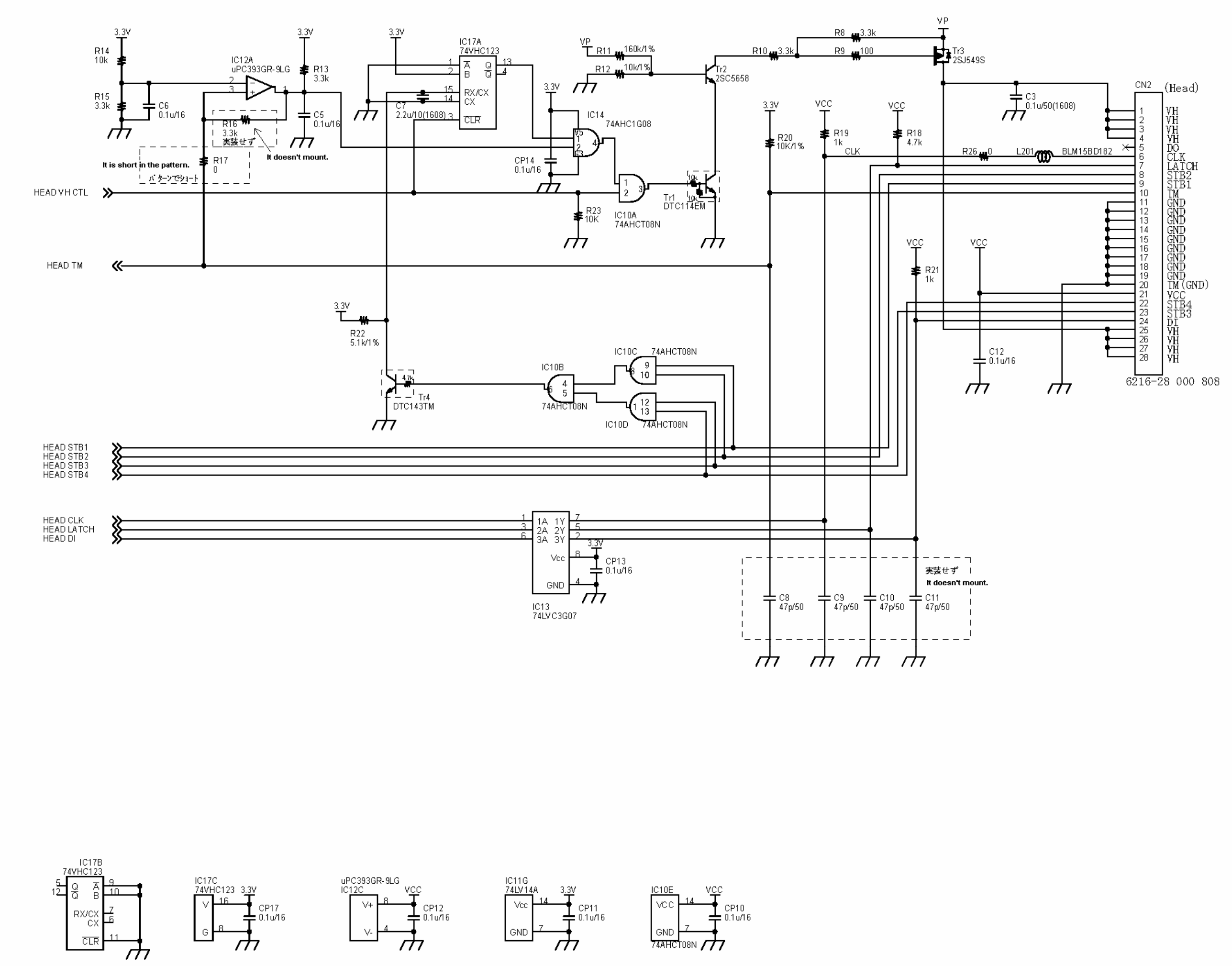
4-1-2. Main Control Board (RAM, ROM)



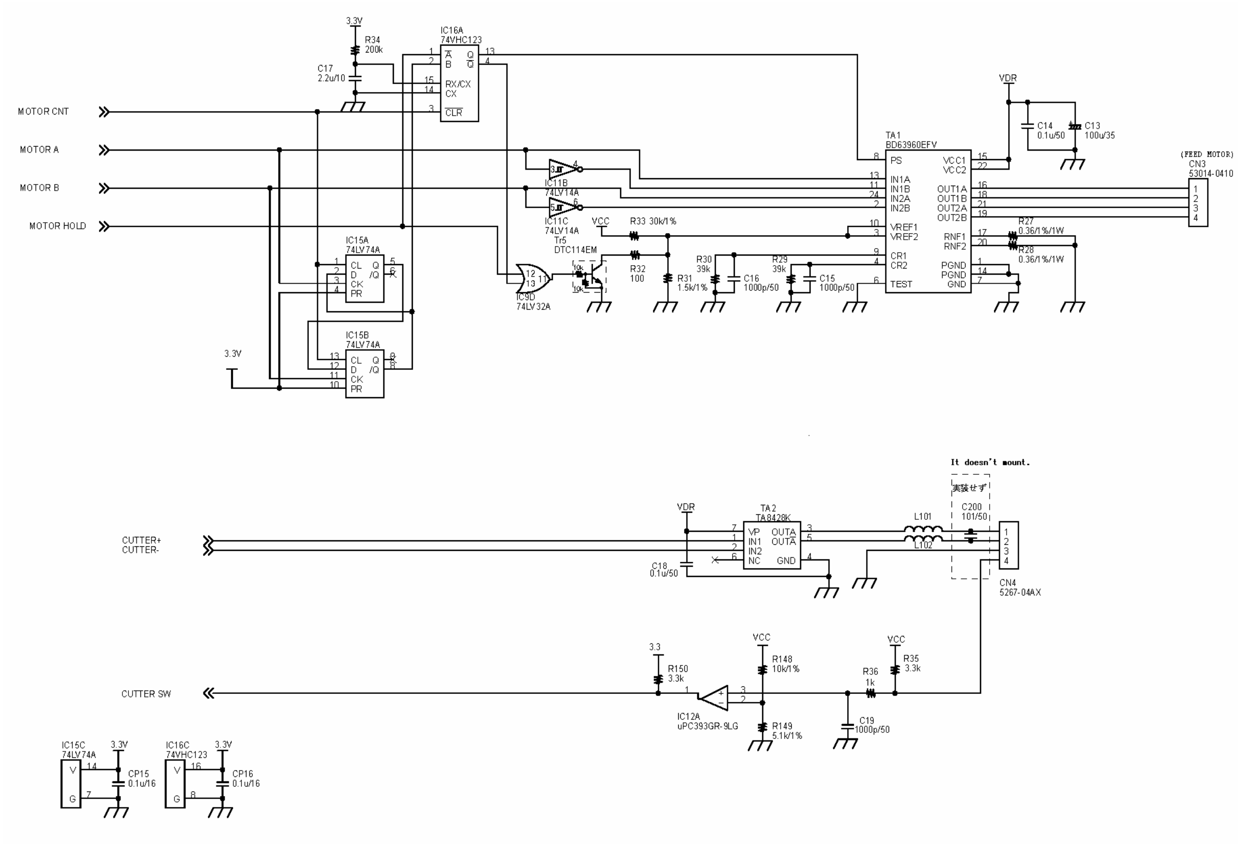
4-1-3. Main Control Board (EXTEND PORT)



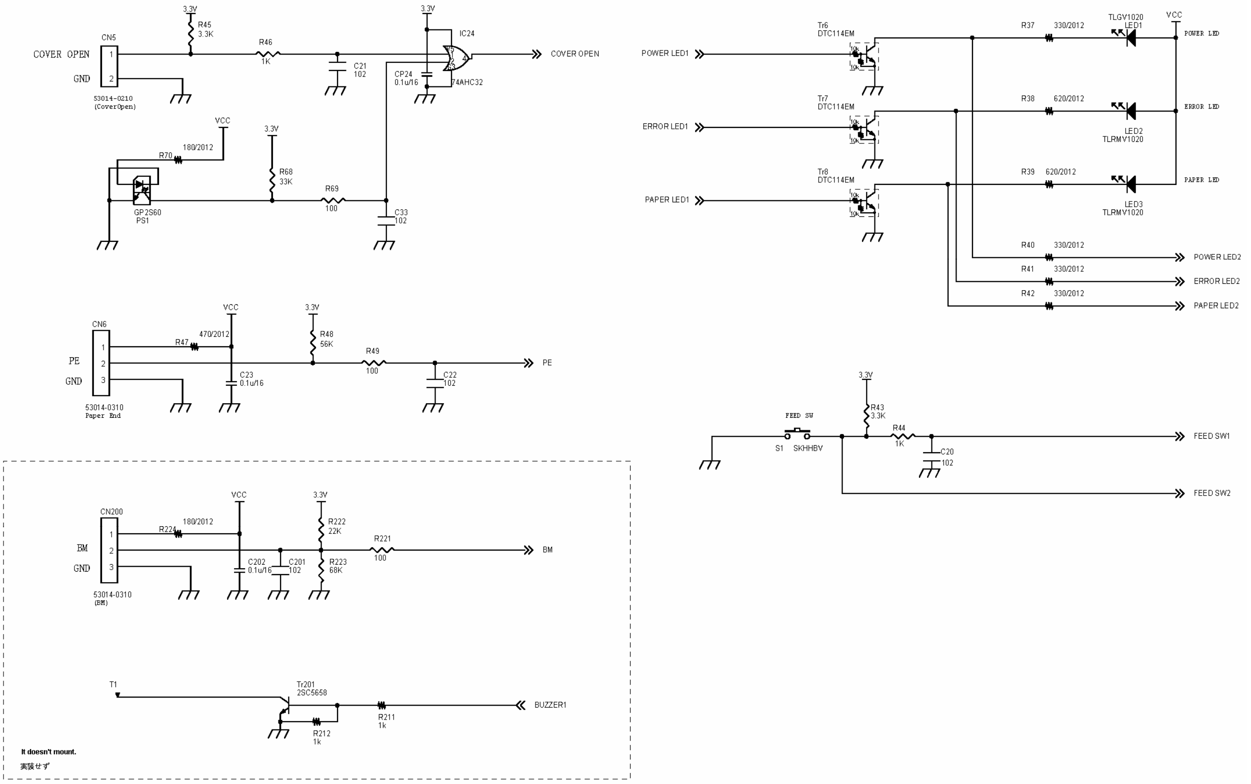
4-1-4. Main Control Board (HEAD)



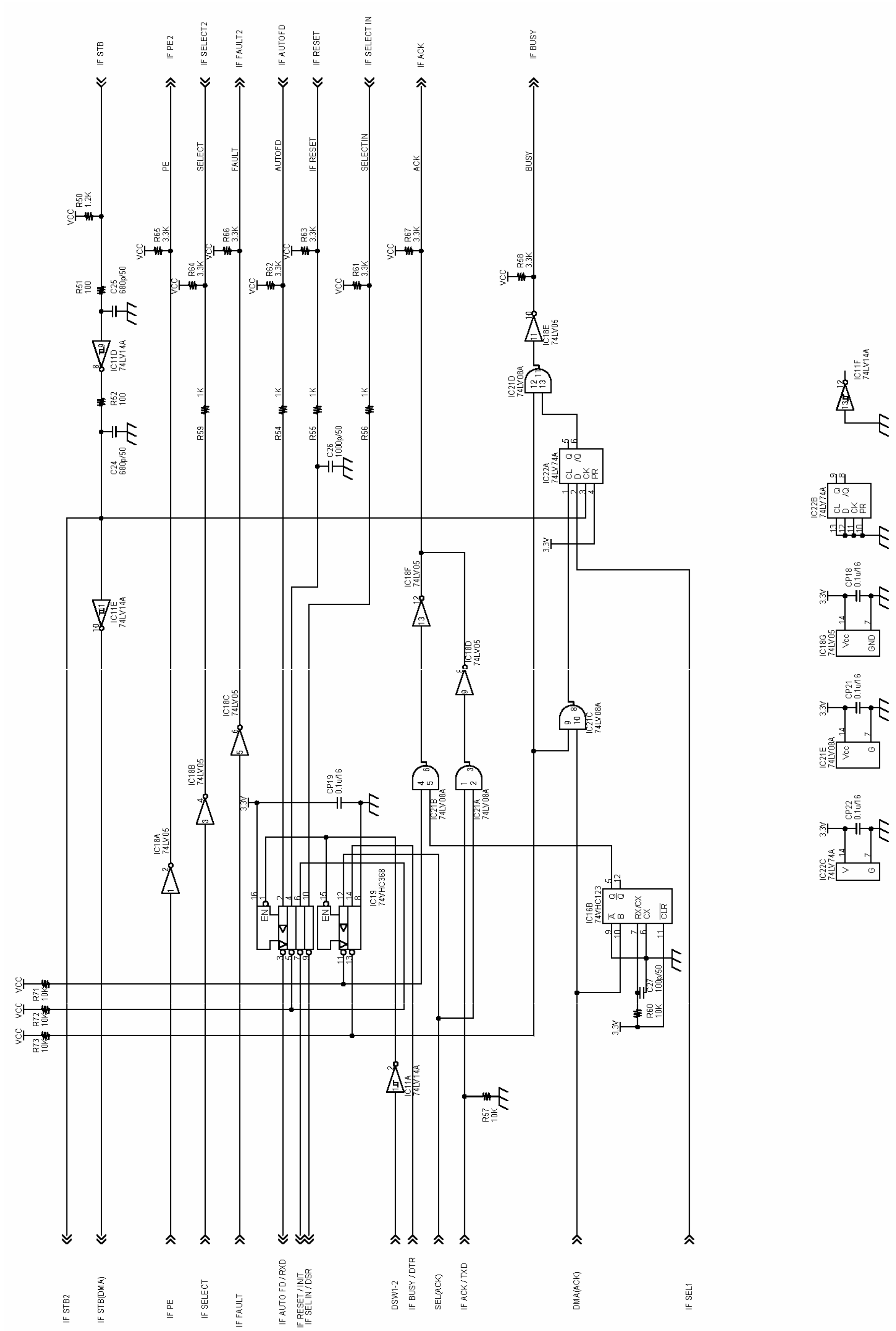
4-1-5. Main Control Board (FEED MOTOR, CUTTER)



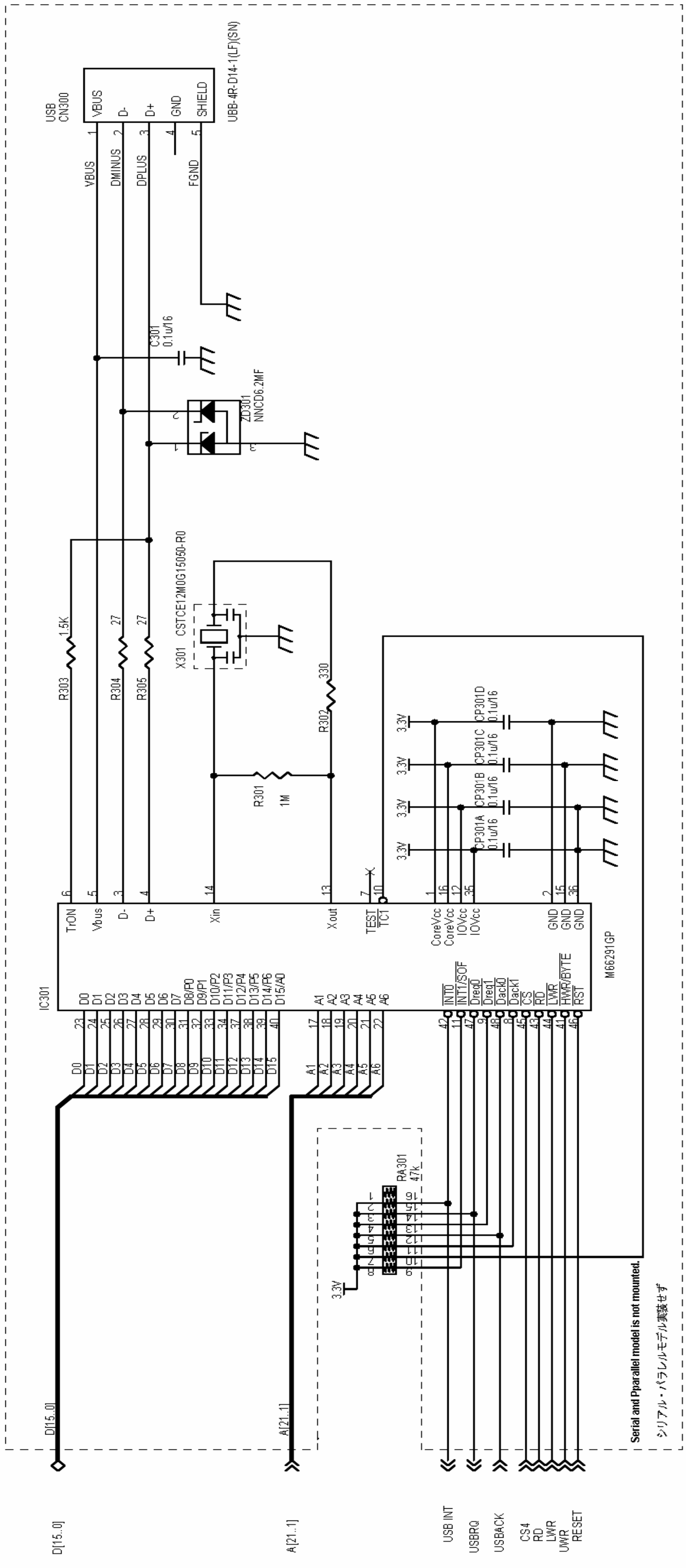
4-1-6. Main Control Board (SENSOR)



4-1-7. Main Control Board (PARALLEL I/F)



4-1-8. Main Control Board (USB I/F)



4-1-9. Main Control Board (SERIAL I/F, POWER)

